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Report

OF THE

Botanical Survey of India

FOR

1953-54.

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ANNUAL REPORT OF THE ACTIVITIES OF THE BOTANICAL SURVEY OF INDIA (SYSTEMATIC DIVISION) FOR THE YEAR 1953-54

Staff :—The duties of the Director, Botanical Survey of India and other interests at the Herbarium were discharged by Dr. K. Biswas, Superintendent, Indian Botanic Garden, Calcutta. Sri R. Seshagiri Rao, M. Sc., Systematic Assistant was on leave from 30-3-53 to 1-6-53 and on joining on the 2nd June 1953, carried on his duties throughout the rest of the period under report. Dr. S. K. Mukherjee, M. Sc., Ph. D. (Edid)., Curator of the Herbarium, Indian Botanic Garden, carried on the duties of the Systematic Assistant in addition to his own during the latter's leave period.

Tours :—During the period under review the Superintendent inspected the cultivation of the medicinal plants at Rongo. The Scheme for the Cultivation of Medicinal Plants in the Eastern Himalaya has been taken up under the auspices of the Indian Council of Agricultural Research and the Medicinal Plants Committee set up by the Govt. of West Bengal. He attended the meetings of the Medicinal Plants Committee of the I. C. A. R. held at Srinagar, Kashmir on the 26th and 27th October 1953. He took that opportunity to visit the Drug Cultivation at Taumerg and collected about 150 specimens of plants, seeds and bulbs from Gulmarg and neighbouring areas of Srinagar. A fairly good collection of the water plants were also collected from the Chunarbal canal, Jhelum river, Dal Lake, Nagin Lake, Hajratbal Lake, Gajribal Lake and Shalimar Lake.

Dr. E. K. Janaki Ammal, Officer-on-Special Duty, Shri K. S. Srinivasan, Curator, Industrial Section, Botanical Survey of India and several research workers from various educational and research institutions such as, the Presidency College and City College, Calcutta, Central Inland Fisheries Research Station, Barrackpore, Publication Division, C. S. I. R., New Delhi, Bengal Immunity Research Institute, Calcutta, Bose Institute, Calcutta, Forest Research Institute, Dehra Dun, worked in the Herbarium from time to time.

Among the visitors to the Herbarium and the Gardens may be mentioned Shri H. C. Mookerjee, Governor of West Bengal, Shri K. D. Malaviya, Deputy Minister, Ministry of N. R. & S. R., New Delhi, Dr H. J. Bhaba, F. R. S., Chairman, Atomic Energy Commission, Dr. Jiro Kawakita, Keio University, Japan, Dr. Grope Brauckmann, University of Gottingen, Germany, Shri Shwe Tha Htur, Dy. Director of Agriculture, Burma, Prof. C. Nakane, Tokyo University, Japan, Mr. Macid Gulcur, Forest Experimen-

tal Station, Bolu, Turkey, Hon'ble Madame Dmitriguna Kovrigina. Deputy Minister for Health, U. S. S. R. and members of the Soviet Scientific Delegation, Mrs. and Prof. Julian Huxley. Members of the Afgan Cultural Mission and several others from different parts of India and abroad.

The routine work such as mounting, repairing, incorporating, replacing the genus and species covers and numbering of the Herbarium sheets have been carried out (Vide Appendix I). Specimens from various institutions in India and from Kabul University, Afganistan have been identified. Several Herbarium sheets were sent on loan for research workers in various Institutions in India and abroad (Vide Appendix I). 101 specimens collected from the Near East, the Mediterranean and the Arabian regions by the Botany Department, Hebrew University, Jerusalem were received at the Herbarium as gift. 100 specimens of East Himalaya and 50 medicinal plants were presented to the Director of the Museum of Education, the Hague, Holland as gift from our Herbarium.

Information on both scientific and economic aspects relating to the vegetable resources of India was supplied to various research workers and industrialists in India and abroad in reply to their queries. Such information includes notes on nomenclature, distribution, descriptions, cultivation of different species or varieties of flowering plants and other allied subjects (Vide Appendix II). In addition to those, several plant materials for research work, demonstration and exhibition purposes were also supplied to many correspondents in and outside India (Vide Appendix III).

Research :—Various species of *Indigofera*, *Kaempferia*, *Fraxinus*, *Stourogyne*, *Aponogeton*, *Sagittaria*, *Pogostemon*, *Musa*, *Bambusa*, *Gigantochloa*, *Riccia*, *Baliospermum*, *Abies*, *Canavalia*, *Garuga*, *Artabotrys* and various genera of *Rafflesiaceae* were critically examined and the nomenclature of some of the specimens was corrected by the Systematic Assistant.

Full co-operation of the Systematic Assistant was afforded to staff of the Indian Botanic Garden in the preparation of coloured plates and notes and in the display of several medicinal and other economic plants in the Govt. of West Bengal Exhibition arranged at Kalyani in connection with the 59th All India Congress Session in January 1954. This item of the Exhibition was highly appreciated and attracted thousands of visitors.

Work on Indian Rose carried out by Shri V. Narayanaswami, Research Assistant, Council of Scientific and Industrial Research under the direction of the Superintendent was completed and an elaborate illustrated monograph under the title "Monograph of Rose Cultivation and Otto of Rose Industry in India" by V. Narayanaswami and K. Biswas containing various aspects of the work was submitted to CSIR.

The following papers were published during the year under report :—

1. "Rajputana Desert Vegetation" by K. Biswas, and R. S. Rao-Proceedings of the National Institute of Science of India, Vol 19, No. 3, 1953.

2. "Preservation of Wild Life" (Editorial) by K. Biswas-Science and Culture, May 1953.

3. "Rauwolfia Drug" by K. Biswas-Science and Culture, June 1953.

4. "Abstracts of various scientific papers" by R. S. Rao-Biological Abstracts, June 1953.

5. "Occurrence of *Paragrewia* Gagnep in India and Burma" by R. S. Rao-Jour. Bomb. Nat. Hist, Vol. 51, No. 3, 1953.

6. "Revision of Indo-Malayan species of *Chonamerpha* G. Don" by R. S. Rao, Jour. of Ind. Bot. Soc.. Vol. 32, No. 1 & 2, 1953.

7. "Algae as substitute food for human and animal consumption" by K. Biswas-Science and Culture, Vol. 19, No. 5, Nov. 1953.

8. "Records of B. S. I., Vol. XVI, No. 1. containing monographic article entitled "The Flora of Khandala on the Westesn Ghats of India" by H. Santapau and No. 2 entitled "Studies of Indian Berberidaceae from Botanical, Chemical and Pharmaceutical Aspects" by R. Chatterjee.

The following papers have been sent for publication and they are passing through the press :—

(1) "Hand-book of Common Water and Marsh Plants of India and Burma" (2nd Edition) by K. Biswas, Govt. of India Press.

(2) "Relationship of the Indian Flora with special reference to countries bordering Indian Ocean by K. Biswas—Report on the Flora of India prepared by the Committee on Biological Sciences, Pan Indian Ocean Science Association.

(3) "Observation on the sand vegetation of some parts of Bengal, Orissa and Madras" by K. Biswas and S. K. Chaudhury.

Nearly 220 papers and notes on different branches on Indian Botany were published during the period under report in various Indian and foreign journals. 14 Indian species and varieties new to science have been published (Vide Appendix IV).

29 copies of Records of the Botanical Survey of India and 32 copies of Duthie's Flora of the Upper Gangetic Plain were sold out accuring a total revenue of Rs. 125-8-0.

The budget estimate for the Systematic Division of the Botanica Survey of India for the year 1953-54 was Rs. 1,75,700 of which Rs. 70,507/- was spent during the period under report.

Sd/- R. S. Rao,
for Superintendent,
Indian Botanic Garden, Calcutta.

APPENDIX I

Salient activities connected with the Herbarium, Indian Botanic Garden, Calcutta for the year 1953-54.

1.	No. of specimens mounted and incorporated in the herbarium	...	4116
2.	No. of specimens repaired in the Herbarium	...	5161
3.	No. of Genus covers replaced ,, ,,	...	48
4.	No. of species covers replaced ,, ,,	...	268
5.	No. of specimens stamped and numbered in the Herbarium	...	13545
6.	No. of specimens identified ,, ,,	...	4213
7.	No. of specimens sent on loan to different research workers	...	483
8.	No. of specimens returned from loan (including those taken during the previous year)	...	805

APPENDIX II

Notes on Nomenclature and distribution of :—

Ruellia, *Dipteracanthus*, *Garcinia*, *Faradaya*, *Forstenia*, *Funtumia*, *Staurogyne*, *Rhea*, *Lilium*, 18 *Lac-host plants* (such as *Bacharis*, *Beyeria*, *Chrysobalanus*, *Condalia*, *Coursetia*, *Covillea*, *Cratoxylon*, etc), 21 Homeopathic drug plants available in India (such as *Medicago*, *Arctium*, *Artemisia*, *Citrallus*, *Crataegus*, *Eugenia* etc.) 39 species of Indigenous drug plants used in veterinary practice along with their alkaloid contents, *Crescentia*, with economic uses of fruits, *Fraxinus*, *Frankonia*, *Froskohlea*, *Gastrochilus*, *Achillea*, *Ceratonia*, *Ferula*, *Cryptocoryne*, *Aponogeton*, *Sagittaria*, *Brachiaria*, *Chonopodium*, members of *Araliaceae*, *Lithespermum*, *Ravina*, *Quillaja*, *Desmodium*, *Musa species*, *Glycyrrhiza*, *Grewia*, *Eugenia*, *Flacourtia*, *Annona*, *Baccauria*, *Garuga*, *Gouania*, *Robinia*, *Gentiana*, *Solanum* species, *Zygadenus*, *Morus* and *Tribulus*.

Descriptions of :—

Brasonia flowers, *Ephedra* species, *Lithospermum*, *Citrus* species, *Bothriochloa*.

Notes on cultivation of :—

Species of *Plantago*, *Carica papaya* with references, Patchouli of commerce (*Pogostemon Cablin*), *Cananga edorata*, Locust bean.

Notes on miscellaneous subjects such as :—Literature on Indian plants that can grow in Texas Gulf area, on Indian Famine Foods, on Indian aquatic plants, on Indian Bryophytes and on Algology and Limnology published by members of the Department of the Botanical Survey of India and Indian Botanic Garden ; on Algology and other allied subjects connected with Pisciculture and on Beautiful Flowers of India : Programme of work for Production of Scientific Literature and for the development of science consciousness among the people ; Details on botanical explorations and literature on the flora of Spiti and Lahoul, Work on Industrial possibilities of large scale culture of algae particularly *Chlorella* ; flowering and fruiting periods of various species of Palmae, Annonaceae and Dilleniaceae cultivated in the Indian Botanic Garden ; Distribution, possibility of cultivation and chemical composition of the Indian and African species of *Strophanthus* ; availability and sources of supply of seeds of Allspice, nutmeg, *Pelargonium* and *Hibiscus* ; Distribution, medicinal uses and sources of supply of *Rauwolfia serpentina* ; Cultural relations of Botanical Survey of India and Indian Botanic Garden, Calcutta with the scientific institutions of foreign countries in reply to UNESCO questionnaire ; Species of palms growing in the Indian Botanic Garden, Forestry Research Institute, Taiwan ; floral structure of *Canavalia gladiata* ; distribution, economic uses and correct identity of an African species of *Andropogon* ; characteristic features of species of *Artabotrys* and their affinities with new species sent from Singapore; distribution and sources of supply of seeds of *Luffa* ; various characters, development and other allied matter of *Rauwolfia serpentina* as requested by Mr. J. Monachine of New York Botanical Garden ; Literature on various aspects of Indian flora ; Literature on distribution and collection of Cacti and other succulents ; Occurrence and economic importance of seeds of *Bixa orellana* ; Literature, habitat and distribution of Indian aquatic species suitable for aquaria ; Production and other aspects of Geranium oil in India ; distribution and sources of supply of seeds of foreign medicinal plants ; collection of *Drypotes* and *Baliospermum* ; systematic position of the Himalayan species of *Abies* and *Chonomorpha mollissima* Boer.

APPENDIX III

Materials supplied and received

Living plants :— (Supplied)	12 interesting Indian Plants to Director, Royal Botanic Garden, Kew, England for Chelsea Coronation Show.
	Cactus plants for the Prime Minister of India.

Fixed material of flowers fruits, seeds and other plants of: (Supplied)	*Memecylon*, *Heimia*, *Coix*, *Pterospermum* and *Magnolia*.
Seeds (received) :—	Seeds of 60 species collected from Spiti, Western Himalaya by Director, Birbal Sahni Institute of Palaeobotany, Lucknow. Seeds of *Kochia* from Delhi.

APPENDIX IV

List of new Indian Species and varieties of Angiosperms published

Polygala carnosa Mukherjee.
Polygala hyalina Wall. ex Hassk. var. *pusila* Mukherjee.
Chonemorpha pedicellata Seshagiri Rao.
Paragrewia poilanei Gagnep. ex Seshagiri Rao.
Vitis hexamera Gagnepain.
Dimeria acutipes Bor.
D. ceylanica Bor.
D. fischeri Bor.
D. ornithopoda Trin. var. *Khasiana* Bor.
,, ,, ,, var. *gracillima* Bor.
,, ,, ,, var. *megalantha* Bor.
D. deccanensis Bor.
D. orissae Bor.
D. ballardii Bor.
Sarcandra irvingbaileyi Swamy.

INDUSTRIAL SECTION, INDIAN MUSEUM, BOTANICAL SURVEY OF INDIA, CALCUTTA

ANNUAL REPORT FOR THE YEAR 1953-54

The post of the Director, Botanical Survey of India being held in abeyance, his duties in so far as it concerned the Industrial Section and the Survey except the Systematic Division, were carried out by the Curator. He also served as an ex-officio Trustee of the Indian Museum and as the Honorary Secretary to the Trustees.

No tours were undertaken during the year as the tours proposed for the collection of specimens for the Museum had to be abandoned at the instance of Government of India.

The Industrial Section, Indian Museum, concerns itself mainly with the collection, preservation, proper maintenance and display of all plants and plant products, chiefly to illustrate the vegetable wealth of India in relation to Agriculture, Forestry, Medicine, Commerce and Industry. The Exhibition galleries, quite apart from serving as an institution for the correct identification of plants and plant parts for research purposes, afford entertainment to the general public and substantially help in the dissemination of knowledge on economic and other groups of plants in India.

The Section received the usual care and attention. The number of specimens treated with proper preservatives against possible deterioration due to the action of insects, pests, moulds etc. was 24,198. Labelling work was carried out with greater vigour and over 10,500 labels of exhibits were displayed as against 6,215 in the previous year. Over 260 exhibits of economic timbers were rearranged according to their economic uses. 91 maps of India showing the distribution of economic timbers were also prepared in the department and exhibited in their appropriate places. Flourescent light fittings were arranged at a cost of Rs. 235/8/9 for illuminating the exihibits of models illustrating the coir industry in India and also the transparencies exhibited in the Miscellaneous Bay of the Gallery. Two show-cases of special design were made to order at a total cost of Rs. 5,967/3/-. The expenditure on the show-cases as well as on the flourescent illumination were met from the departmental budget grant. 800 containers for index collections were purchased for the gallery at a cost of Rs. 2,829/9/-, and met from the Restoration grant, kindly provided by the Trustees.

The general acquisition to the Museum had to be very moderate and selective only owing to the necessity to effect economy on expenditure. The total number of acquisitions made during the year was only 669. The general accessions included *inter alia* medicinal plants products (69) ; food products (75) ; fibres and fibre-yielding plants (96) ; dye and tan yielding plant products (12) ; oil-seeds (96) ; gums and resins (4) ; maps of timber specimens (91) ; mats and matting materials (4) ; models of furniture (9) ; models of musical instruments (11) ; toys-characteristics of Andhra (24); Benares (22); Bengal (16) etc. ; bamboo articles (6) ; beads of different kinds of wood (11) and several other specimens of interest. 24 lantern slides and 84 photographs on various subjects were also added to our previous collections.

Three exhibitions were arranged by this section during the year, at the request made by the City College Biological Association, Calcutta and the Bangabasi College. The high appreciations of these institutions on our educational activities are acknowledged.

Two lectures were arranged by the Curator in the Museum popular lecture series and in one of which the Curator participated, when he delivered a lecture of "Tinnevelly mats—a cottage industry of South India". The other lecture was delivered by the Director of Industries, West Bengal on "Cottage Industry of West Bengal". A cinema show of the Mat Industry was also arranged in the first lecture, the documentary being prepared by the Curator, Industrial Section.

The number of local and foreign enquiries dealt with during the year was as usual, varied and large. The information supplied related to crude drugs, their availability in commercial quantities and their sources etc., oil-seeds, species and various other economic plants and plant products. Relevant notes on herbal farming, geographical distribution, vernacular names of plants were also supplied to various parties in need of such information. Authentic materials were also procured and supplied for research and study purposes, to universities, scientific departments and commercial concerns in the country.

The reorganisation of the library attached to the Industrial Section was continued involving reaccessioning, labelling, indexing and cataloguing of the collections. The printing of the first part of the catalogue of this library is in progress. Over 852 publications were added to the library and over 1200 ledgers containing valuable information on economic Botany were also attended to. Among the rare and very valuable purchases made during the year for the Indian Museum may be mentioned Schmidt's Atlas der Diatomaceen Kunde and Okamura's Icones of Japanese Algae at a total cost of £235-6-7.

In the Industrial Section Herbarium, 3,690 herbarium specimens were prepared, 74 new specimens were collected and incorporated, 6,418 sheets were treated and 1,422 labels were affixed. The more recent collections are being arranged on a regional basis. Four pigeon-holed steel cabinets were purchased at a cost of Rs. 992/7/- for the proper maintenance of the valuable cryptogamic collections of the Museum. Their cost was also met from the departmental budget.

The collection of sea-weeds made by the Curator and his Assistants from Andaman and Nicobar Islands during February-March 1953, were sorted out, examined and a portion of the same was critically studied by the Curator. The collections, quite apart from being the first systematic collections made for the Indian Museum of comparatively little known plants from these distant shores are also very valuable as they contain rare and very interesting sea-weeds, which do not appear to have been recorded earlier from the Indian territorial waters.

The Curator also critically examined his earlier collections of Orchids from Nepal. This revealed about ten (10) species, which are not reported by Burkill in his valuable account of the Flora of Nepal (1907) and by Hooker in his Flora of British India (1891). These species are being further examined as regards their distribution.

The Curator also studied the Diatom flora of the Chilka Lake in India, which also revealed several species new to Indian waters. The work is in progress. Photomicrographs of the species taken by the Curator, were also added on to the Museum collections.

The Visiting Committee, appointed by the Trustees of the Indian Museum, Calcutta, inspected the galleries and the collections on the 1st March 1954, and while expressing their high appreciation of the efficiency maintained, recommended to the Trustees for the early expansion of the Section, to atttain its full stature to enable it to achieve the real objectives of an institution of its kind. A party of 10 students from Gauhati College, Assam, led by one of the Professors of the College, visited the Section and were shown round the galleries. The total number of visitors registered for the year was 4,82,651.

The departmental grant, under pay and allowances of staff, and other charges for the year 1953-54 was Rs. 92,300/- out of which the sum of Rs. 80,697/- was spent and the balance surrendered. A sum of Rs. 6,524/-

was available to this Section from the Indian Museum Post-War Trust Fund, out of which the sum of Rs. 3,502/- alone was spent.

Sd/- K. S. Srinivasan,
Curator,
Industrial Section, Indian Museum.